



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX

75 Hawthorne Street  
San Francisco, Ca. 94105

88216523

AR0013

July 5, 1991

TECHNICAL MEMORANDUM

SUBJECT: REVISED REMOVAL ACTION GUIDELINE FOR THE BLUEWATER URANIUM SITES.

FROM: Robert Bornstein *RB*  
On-Scene-Coordinator  
Emergency Response Section

TO: Jeff Zelikson, Director  
Hazardous Waste Management Division

It has been brought to our attention that there was an error made in the calculation of the appropriate "action" guideline stated in the Action Memorandum dated June 7, 1991. The background calculation and subtraction was not performed properly and should be corrected.

The correct calculation for the "action" guideline is below:

The National Council on Radiation Protection and Measurements (NCRP) Report 91 on the Recommendations on Limits for Exposure to Ionizing Radiation estimates the average total background radiation exposure from all sources to the U.S population is approximately 300 mrem/yr. Of this 300 mrem/yr, approximately a third is caused by natural gamma radiation. The NCRP guideline recommends that populations should be limited to excess exposures (above background) to less than 100 mrem/yr.

ERS has determined that the natural background for the area is approximately 15 uR/hr.

For areas reading 165 uR/hr, 150 uR/hr is considered excess gamma radiation.

$$165 \text{ uR/hr} - 15 \text{ uR/hr} = 150 \text{ uR/hr above background}$$

ERS has estimated that the local population spends approximately 2 hours a day in areas affected by the mining operations for 300 days out of the year. Therefore, the population is

exposed to the following amount of excess gamma radiation:

$$150 \text{ uR/hr above background} * 2 \text{ hr exposure} * 300 \text{ days/yr} \\ = 90,000 \text{ uR/yr or } 90 \text{ mR/yr}$$

90 mR/yr is approximately equal to 90 mrem/yr, since, 1 mR/yr is approximately equal to 1 mrem/yr for gamma radiation. Population exposed to areas below 165 uR/hr (150 uR/hr above background) require no emergency response action, and fall within the acceptable excess exposure limit set by the NCRP limit of 100 mrem/yr.

Therefore, as discussed in the Action Memorandum, areas of frequent public use that exceed the "action" guideline (150 uR/hr above background) will be covered with clean fill to adequately reduce the gamma emissions to the standards specified under the Uranium Mill Tailing Radiation Control Act of 1978. This corrected "action" guideline will not increase the scope or cost of the removal action which has been estimated to be \$629,770.00.

cc: ERD-HQ  
OAR  
ATSDR  
IHS  
DOI  
DOE  
Navajo Superfund